



# **Living and Working in Space: Habitat**

## **Assessment Rubric: Trash or Treasure**

## Living and Working in Space: Habitat

### Assessment Rubric Trash or Treasure

Guide Questions: How can matter be recycled effectively? What modifications are necessary for extended space missions?

Task to be assessed: Students will design a system to recycle matter in a habitat for six researchers on the Moon or Mars and explain why it should be successful.

#### Knowledge Areas

	<b>Exemplary</b>	<b>Proficient</b>	<b>Developing</b>	<b>Novice</b>
Understanding of how matter is recycled on Earth	Design includes recycling of all biological and manufactured matter modeled on Earth ecosystems. Attempt is made to present recycling quantitatively. Presentation describes how matter is recycled within Earth ecosystems and how the student design is different.	Design includes recycling of biological and manufactured matter modeled on Earth ecosystems. Presentation describes recycling within Earth ecosystems.	Design includes biological recycling of some materials. Other materials, especially manufactured items, are separated by material type and reprocessed using industrial recycling techniques. Presentation explains methods.	Design involves using and discarding materials by separating materials by type (e.g., aluminum, plastic, etc).
Understanding of current technology	Current technology appropriately supplements ecosystem and is appropriate for the Moon or Mars. Presentation clearly and accurately describes the technology used and its role in supporting the ecosystem. Attempt is made to quantitatively determine and describe characteristics. New materials are proposed for manufactured items to make them more easily recycled.	Technology appropriately supplements ecosystem and is appropriate for the Moon or Mars. Presentation describes how the technology supports the ecosystem.	Student uses technology described for the International Space Station. Presentation describes what technology is used.	Student uses technology familiar in the home or school.

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### Assessment Rubric Trash or Treasure (continued)

Knowledge Areas (continued)				
	Exemplary	Proficient	Developing	Novice
Understanding of resources and challenges on the Moon or Mars	Design includes accurate information about the resources and challenges to recycling material on the Moon or Mars. Choice of location is explained. Attempt is made to quantify resources and challenges in comparison with Earth.	Design uses local resources and technology to solve the challenges to recycling material on the Moon or Mars. Presentation describes how challenges are met.	Design is modeled after systems on the ISS or recycling of manufactured material on Earth. Presentation describes challenges of recycling on the Moon or Mars.	Design is based on the assumption that Mars is very similar to Earth, but hotter (or colder), and the resources will be the same.  OR Design includes constant re-supply.
Integration of knowledge	Design takes into account the way Earth ecosystems recycle material, current technology, and modifications necessary for the Moon or Mars. Presentation describes the inter-relatedness of all knowledge areas clearly and accurately.	Design takes into account the way Earth ecosystems recycle material, current technology, and modifications necessary for the Moon or Mars.	Design takes into account more than one knowledge area, and one dominates.	Design tends to focus on one knowledge area, assuming the Moon or Mars will not be different from Earth.
Construction of Design Model	The model represents all of the elements of the design clearly and accurately. Functionally appropriate materials are chosen and used creatively. The model is attractive and informative.	The model represents all of the elements of the design. The materials are functionally appropriate and add to the understanding of the design.	The model represents the functionally critical elements of the design. Functionally appropriate materials are used.	The model focuses on the aspects that stand out or are of interest to the builder. Materials are chosen for attractiveness or availability.

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### Assessment Rubric Trash or Treasure (continued)

	<b>Exemplary</b>	<b>Proficient</b>	<b>Developing</b>	<b>Novice</b>
<b>Effectiveness of Presentation</b>	Presentation was clear, accurate, well organized, and interesting. Visual aids were accurate, attractive and important to the presentation. A focus of the presentation was the audience understanding the plan and the reasons to expect success at chosen location.	Student presentation organized ideas in a logical or creative way. Visual aids were used to highlight the ideas. A focus of the presentation was the audience understanding of the diet and exercise plan.	Student presentation was clear and organized. Visual aids were used.	Student presented ideas as they came to mind.